

WHAT IS CLAIMED IS:

1. A wavelength multiplexing optical transmission system comprising:

a compensating unit which compensates polarization mode dispersion of wavelength-multiplexed and transmitted light signal for each predetermined channel block;

a wavelength selecting unit which selectively outputs light signal having a desired wavelength in the light signal;

a polarization analyzing unit which analyzes polarization mode dispersion based on light signal having a wavelength selected by said wavelength selecting unit; and

a compensation control unit which controls polarization mode dispersion for each predetermined channel block by said compensating unit based on the result of analysis in said polarization analyzing unit.

2. A wavelength multiplexing optical transmission system according to claim 1 wherein said polarization analyzing unit analyzes polarization mode dispersion using Jones Matrix method.

3. A wavelength multiplexing optical transmission system according to claim 1 wherein said polarization analyzing unit analyzes polarization mode dispersion using Poincare

sphere method.

4.     A wavelength multiplexing optical transmission system  
according to claim 1 wherein said polarization analyzing  
5     unit analyzes polarization mode dispersion using SOP method.

5.     A wavelength multiplexing optical transmission system  
according to claim 1 wherein said wavelength selecting unit  
comprising:

10         a wavelength variable filter which filters light  
signal having a desired wavelength from inputted light  
signals; and

          a sweeping control unit which sweeps the wavelength  
to be filtered of the light signal.

15

6.     A wavelength multiplexing optical transmission system  
according to claim 1 wherein said wavelength selecting unit  
comprising:

          an optical switch which switches and outputs a desired  
20     light signal from inputted a plurality of light signals;  
and

          switching control unit which controls switching of  
said optical switch.

25

7. A wavelength multiplexing optical transmission system according to claim 1 further comprising:

a light transmitter which transmits wavelength-multiplexed light signal;

5 a light receiver which receives the wavelength-multiplexed light signal; and

a light transmission path connecting said light transmitter and said light receiver, wherein

at least one of said compensating unit or said plurality  
10 of compensating units are provided on said light transmission path or at a terminal end of said light transmission path.

8. A wavelength multiplexing optical transmission system according to claim 10 wherein said wavelength selecting unit

15 and said polarization analyzing unit are provided at a terminal end of or near said light transmission path.

9. A wavelength multiplexing optical transmission system comprising:

20 a wave divider which branches wavelength-multiplexed and transmitted light signal for each predetermined channel block;

a plurality of compensating units which compensate polarization mode dispersion for each light signal branched  
25 by said wave divider;

1 a plurality of wavelength selecting units which  
selectively output light signal having a desired wavelength  
in light signal outputted from each compensating unit;

2 a plurality of polarization analyzing units which  
5 analyze polarization mode dispersion based on light signal  
having a wavelength selected by each wavelength selecting  
unit; and

6 a plurality of compensation control units which  
control polarization mode dispersion by each compensating  
10 unit based on the result of analysis in each polarization  
analyzing unit.

10. A wavelength multiplexing optical transmission system  
according to claim 9 wherein said polarization analyzing  
15 unit analyzes polarization mode dispersion using Jones  
Matrix method.

11. A wavelength multiplexing optical transmission system  
according to claim 9 wherein said polarization analyzing  
20 unit analyzes polarization mode dispersion using Poincare  
sphere method.

12. A wavelength multiplexing optical transmission system  
according to claim 9 wherein said polarization analyzing  
25 unit analyzes polarization mode dispersion using SOP method.

13. A wavelength multiplexing optical transmission system according to claim 9 wherein said wavelength selecting unit comprising:

5 a wavelength variable filter which filters light signal having a desired wavelength from inputted light signals; and

a sweeping control unit which sweeps the wavelength to be filtered of the light signal.

10 14. A wavelength multiplexing optical transmission system according to claim 9 wherein said wavelength selecting unit comprising:

an optical switch which switches and outputs a desired light signal from inputted a plurality of light signals;

15 and

switching control unit which controls switching of said optical switch.

15 15. A wavelength multiplexing optical transmission system according to claim 9 further comprising:

a light transmitter which transmits wavelength-multiplexed light signal;

a light receiver which receives the wavelength-multiplexed light signal; and

25 a light transmission path connecting said light

transmitter and said light receiver, wherein

at least one of said compensating unit or said plurality of compensating units are provided on said light transmission path or at a terminal end of said light transmission path.

5

16. A wavelength multiplexing optical transmission system according to claim 15 wherein said wavelength selecting unit and said polarization analyzing unit are provided at a terminal end of or near said light transmission path.

10

17. A wavelength multiplexing optical transmission system comprising:

a wave divider which branches wavelength-multiplexed and transmitted light signal for each channel;

15

a plurality of wave combiners which combine light signal branched by said wave divider for each predetermined channel block;

a plurality of compensating units which compensate polarization mode dispersion for each light signal

20

multiplexed by said wave combiner;

a plurality of wavelength selecting units which selectively output light signal having a desired wavelength in light signal outputted from each compensating unit;

a plurality of polarization analyzing units which

25

analyze polarization mode dispersion based on light signal

having a wavelength selected by each wavelength selecting unit; and

5 a plurality of compensation control units which control polarization mode dispersion by each compensating unit based on the result of analysis in each polarization analyzing unit.

10 18. A wavelength multiplexing optical transmission system according to claim 17 wherein said polarization analyzing unit analyzes polarization mode dispersion using Jones Matrix method.

15 19. A wavelength multiplexing optical transmission system according to claim 17 wherein said polarization analyzing unit analyzes polarization mode dispersion using Poincare sphere method.

20 20. A wavelength multiplexing optical transmission system according to claim 17 wherein said polarization analyzing unit analyzes polarization mode dispersion using SOP method.

21. A wavelength multiplexing optical transmission system according to claim 17 wherein said wavelength selecting unit comprising:  
25 a wavelength variable filter which filters light

signal having a desired wavelength from inputted light signals; and

a sweeping control unit which sweeps the wavelength to be filtered of the light signal.

5

22. A wavelength multiplexing optical transmission system according to claim 17 wherein said wavelength selecting unit comprising:

an optical switch which switches and outputs a desired  
10 light signal from inputted a plurality of light signals;  
and

switching control unit which controls switching of said optical switch.

15 23. A wavelength multiplexing optical transmission system according to claim 17 further comprising:

a light transmitter which transmits wavelength-multiplexed light signal;

a light receiver which receives the  
20 wavelength-multiplexed light signal; and

a light transmission path connecting said light transmitter and said light receiver, wherein

at least one of said compensating unit or said plurality of compensating units are provided on said light transmission  
25 path or at a terminal end of said light transmission path.



24. A wavelength multiplexing optical transmission system according to claim 23 wherein said wavelength selecting unit and said polarization analyzing unit are provided at a terminal end of or near said light transmission path.

5

25. A wavelength multiplexing optical transmission system comprising:

a wave divider which branches wavelength-multiplexed and transmitted light signal for each predetermined channel

10 block;

a plurality of compensating units which compensate polarization mode dispersion for each light signal branched by said wave divider;

a wave combiner which combines respective light  
15 signals outputted from each compensating unit;

a wavelength selecting unit which selectively outputs light signal having a desired wavelength in light signal outputted from said wave combiner;

a polarization analyzing unit which analyzes  
20 polarization mode dispersion based on light signal having a wavelength selected by said wavelength selecting unit;  
and

a plurality of compensation control units which control polarization mode dispersion by each compensating  
25 unit based on the result of analysis in said polarization

analyzing unit.

26. A wavelength multiplexing optical transmission system  
according to claim 24 wherein said polarization analyzing  
5 unit analyzes polarization mode dispersion using Jones  
Matrix method.

27. A wavelength multiplexing optical transmission system  
according to claim 24 wherein said polarization analyzing  
10 unit analyzes polarization mode dispersion using Poincare  
sphere method.

28. A wavelength multiplexing optical transmission system  
according to claim 24 wherein said polarization analyzing  
15 unit analyzes polarization mode dispersion using SOP method.

29. A wavelength multiplexing optical transmission system  
according to claim 24 wherein said wavelength selecting unit  
comprising:

20 a wavelength variable filter which filters light  
signal having a desired wavelength from inputted light  
signals; and

a sweeping control unit which sweeps the wavelength  
to be filtered of the light signal.

25

30. A wavelength multiplexing optical transmission system according to claim 24 wherein said wavelength selecting unit comprising:

an optical switch which switches and outputs a desired  
5 light signal from inputted a plurality of light signals;  
and

switching control unit which controls switching of  
said optical switch.

10 31. A wavelength multiplexing optical transmission system according to claim 24 further comprising:

a light transmitter which transmits  
wavelength-multiplexed light signal;

a light receiver which receives the  
15 wavelength-multiplexed light signal; and

a light transmission path connecting said light  
transmitter and said light receiver, wherein

at least one of said compensating unit or said plurality  
of compensating units are provided on said light transmission  
20 path or at a terminal end of said light transmission path.

32. A wavelength multiplexing optical transmission system according to claim 31 wherein said wavelength selecting unit and said polarization analyzing unit are provided at a  
25 terminal end of or near said light transmission path.